What is claimed is:

1. An organic semiconductor device comprising an organic semiconductor layer with carrier mobility deposited between a pair of electrodes facing each other, wherein at least one of the electrodes includes a carrier relay layer in contact with the organic semiconductor layer and has a work function close or equal to an ionized potential of the organic semiconductor layer, and a conductive layer which is formed on the carrier relay layer and having lower resistivity than the carrier relay layer.

2. An organic semiconductor device according to claim 1, wherein the carrier relay layer has a work function within a range of ± 1eV with a center of the range corresponding to the ionized potential of the organic semiconductor.

3. An organic semiconductor device according to claim 2, wherein the carrier relay layer has a work function within a range of ± 0.5eV with a center of the range corresponding to the ionized potential of the organic semiconductor.

4. An organic semiconductor device according to claim 1, wherein the carrier relay layer has a maximum layer thickness at 1000Å.

5. An organic semiconductor device according to claim 4, wherein the carrier relay layer has a maximum layer thickness

at 500Å.

6. An organic semiconductor device according to claim 1, wherein the carrier relay layer is configured as a plurality of islands spaced apart with respect to each other.

7. An organic semiconductor device according to claim 1, wherein the pair of electrodes are a source electrode and a drain electrode, the organic semiconductor layer is deposited between the source electrode and the drain electrode so as to form a channel, and the organic semiconductor device further includes a gate electrode which applies a voltage to the organic semiconductor layer formed between the source electrode and the drain electrode.

8. An organic semiconductor device according to claim 7, further including a gate insulator layer which electrically insulates the gate electrode from the source electrode and the drain electrode.

9. An organic semiconductor device according to claim 7, wherein the source electrode and the drain electrode are both provided on one side of the organic semiconductor layer.

10. An organic semiconductor device according to claim 7, wherein the source electrode and the drain electrode are respectively provided on opposite sides of the organic

semiconductor layer with respect to each other so as to sandwich the layer therebetween.

11. An organic semiconductor device according to claim 8, wherein the conductive layer is made of material having stronger adhesion to the gate insulator layer than the carrier relay layer when the gate insulator layer is in contact with the conductive layer.

12. An organic semiconductor device according to claim 7, wherein the pair of electrodes are a source electrode and a drain electrode, the organic semiconductor layer is deposited in a layer thickness direction so as to be sandwiched between the source electrode and the drain electrode, and the organic semiconductor device further includes a gate electrode which is implanted within the organic semiconductor layer.

13. An organic semiconductor device according to claim 12, wherein the gate electrode implanted within the organic semiconductor layer has one of a lattice, comb, or rattan blind shape.

14. An organic semiconductor device comprising an organic semiconductor layer with carrier mobility deposited between a pair of electrodes facing each other, wherein at least one of the electrodes is an alloy layer in contact with the organic semiconductor layer, the alloy layer includes a first metal

having a work function close or equal to an ionized potential of the organic semiconductor layer, and a second metal having lower resistivity than the first metal.

15. An organic semiconductor device according to claim 14, wherein the first metal has a work function within a range of ± 1eV with a center of the range corresponding to the ionized potential of the organic semiconductor.

16. An organic semiconductor device according to claim 15, wherein the first metal has a work function within a range of ± 0.5eV with a center of the range corresponding to the ionized potential of the organic semiconductor.

17. An organic semiconductor device according to claim 14, wherein the alloy layer has a layer thickness in the range from 100Å to 1μm.

18. An organic semiconductor device according to claim 17, wherein the alloy layer has a layer thickness in the range from 100Å to 3000Å.

19. An organic semiconductor device according to claim 14, wherein content of the first metal within the alloy layer is at least 0.01 atom.%, preferably at least 0.1 atom.%, and more preferably at least 0.5 atom.%, and a maximum of 50 atom.%, and preferably a maximum of 20 atom.%, and more preferably a maximum

of 5 atom.%.

20. An organic semiconductor device according to claim 14, wherein the pair of electrodes are a source electrode and a drain electrode, the organic semiconductor layer is deposited between the source electrode and the drain electrode so as to form a channel, and the organic semiconductor device further includes a gate electrode which applies a voltage to the organic semiconductor layer formed between the source electrode and the drain electrode.

21. An organic semiconductor device according to claim 20, further including a gate insulator layer which electrically insulates the gate electrode from the source electrode and the drain electrode.

22. An organic semiconductor device according to claim 20, wherein the source electrode and the drain electrode are both provided on one side of the organic semiconductor layer.

23. An organic semiconductor device according to claim 20, wherein the source electrode and the drain electrode are respectively provided on opposite sides of the organic semiconductor layer so as to sandwich the layer therebetween.

24. An organic semiconductor device according to claim 21, wherein the second metal is made of material having stronger

adhesion to the gate insulator layer than the first metal when the gate insulator layer is in contact with the alloy layer.

25. An organic semiconductor device according to claim 14, wherein the pair of electrodes are a source electrode and a drain electrode, the organic semiconductor layer is deposited in a layer thickness direction so as to be sandwiched between the source electrode and the drain electrode, and the organic semiconductor device further includes a gate electrode which is implanted within the organic semiconductor layer.

26. An organic semiconductor device according to claim 25, wherein the gate electrode implanted within the organic semiconductor layer has one of a lattice, comb, or rattan blind shape.